Mapping Broadband in Maryland: A Recap

Michael S. Scott, PhD, GISP
Eastern Shore Regional GIS Cooperative
Salisbury University

msscott@salisbury.edu

Why Broadband Mapping?

- High-speed Internet is a geographically-dependent resource
- Location determines the type, speed, quality, and price
- Broadband planning is likely to be incomplete without a map of the existing resources and an understanding of the competitive landscape.
- By definition, a collective attempt to determine the location of high-speed Internet resources will bump into the desire of private companies to obscure
  - Location awareness is a competitive advantage
- There is also the economic development argument…

Maryland's State Broadband Initiative

- SBI was created by the National Telecommunication and Information Administration in 2009
- To map all consumer broadband availability in previously-unavailable detail across the nation
  - Wireline & wireless
  - Direct from broadband service providers to states
  - Extensive state-based verification and testing
- Maryland Broadband Mapping Initiative, 2009-2014
  - Maryland Broadband Cooperative, Inc. of Salisbury, Maryland was the state's designee
  - Partnered with Salisbury Univ & Towson Univ
- 45 facilities-based BSPs participating
- Noted by the NTIA as a national example of Best Practices

Key Constraints/Conditions

- Participation was (largely) voluntary
- Definition of broadband was woefully out-of-date
  - Then, 768 Kbps downstream was used for mapping
  - Now, 10 Mbps downstream is the minimum recommended
- Definition of “served by broadband” was always problematic
  - Census blocks were the minimum mapping unit (14 blocks per mi^2)
  - Provision within 10 business days
- Self-reported by BSPs by a variety of methods
- 14 different error-checking procedures, all of varying effectiveness

Maryland's Broadband Availability (2014)

- By land area
  - 15.9% of the state served by FOTH
  - 47.0% of the state served by cable modem
  - 42.1% of the state served by DSL
  - 12.5% of the state served by fixed wireless
  - 89.1% of the state served by mobile wireless

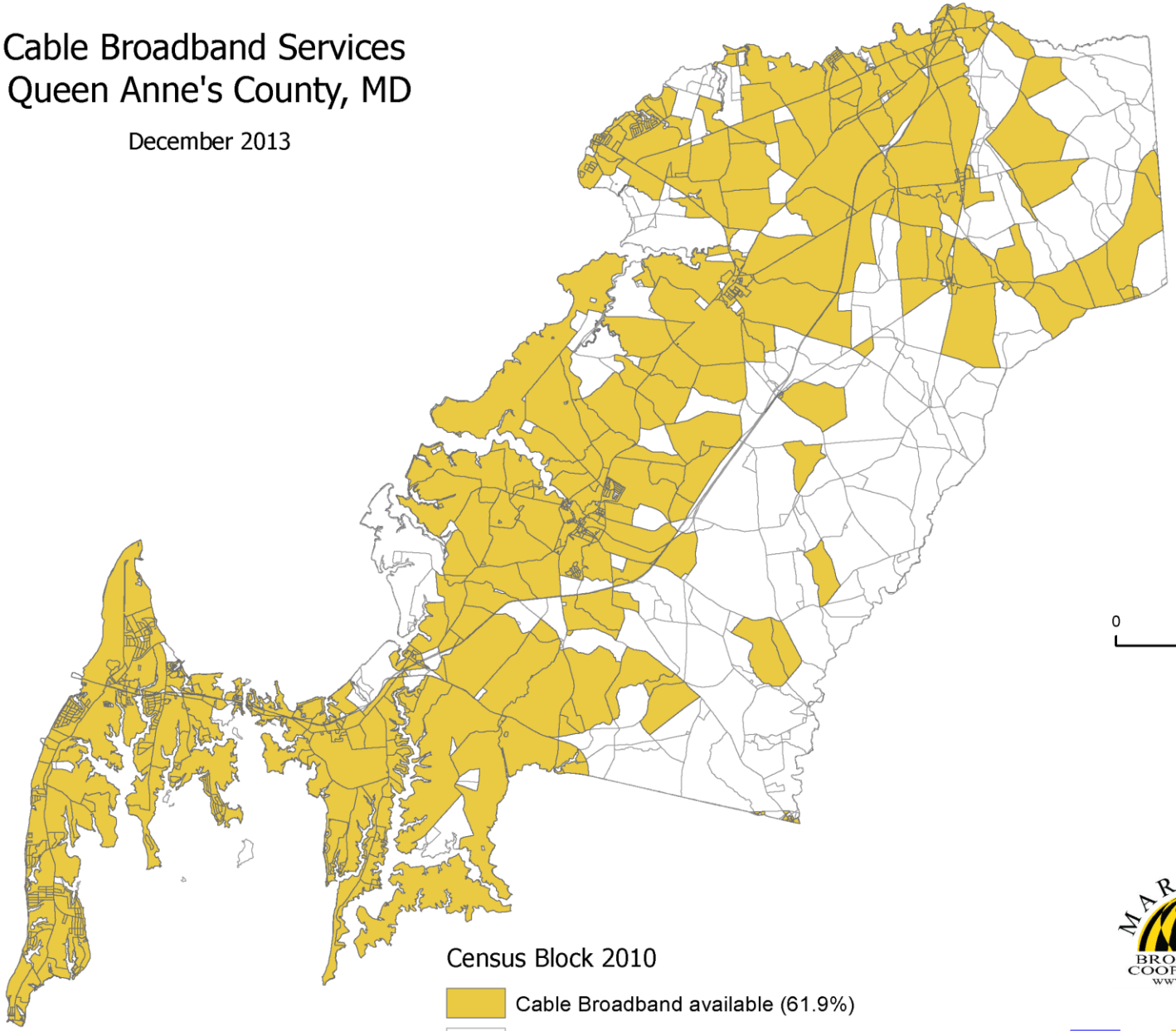
- By population
  - 50.6% of the state served by FOTH
  - 91.8% of the state served by cable modem (482,570 are not)
  - 96.5% of the state served by DSL
  - 98.8% of the state served by mobile wireless

Links to Archived Data

- PDF Maps of different technology by county
  - http://www.esrgc.org/broadbandMaps/
  - Cable, DSL, OCW, FOTH, Fixed Wireless, Mobile Wireless, Wireline (all), Number of Providers
- Interactive Broadband Map that formed the foundation of our consumer outreach as well as our error-checking
  - http://geodata.md.gov/broadbandmap/
  - Try choosing a layer to display, *typing in an address*, examining speed test results
- Raw GIS data is available
  - http://geodata.md.gov/imap/rest/services/UtilityTelecom

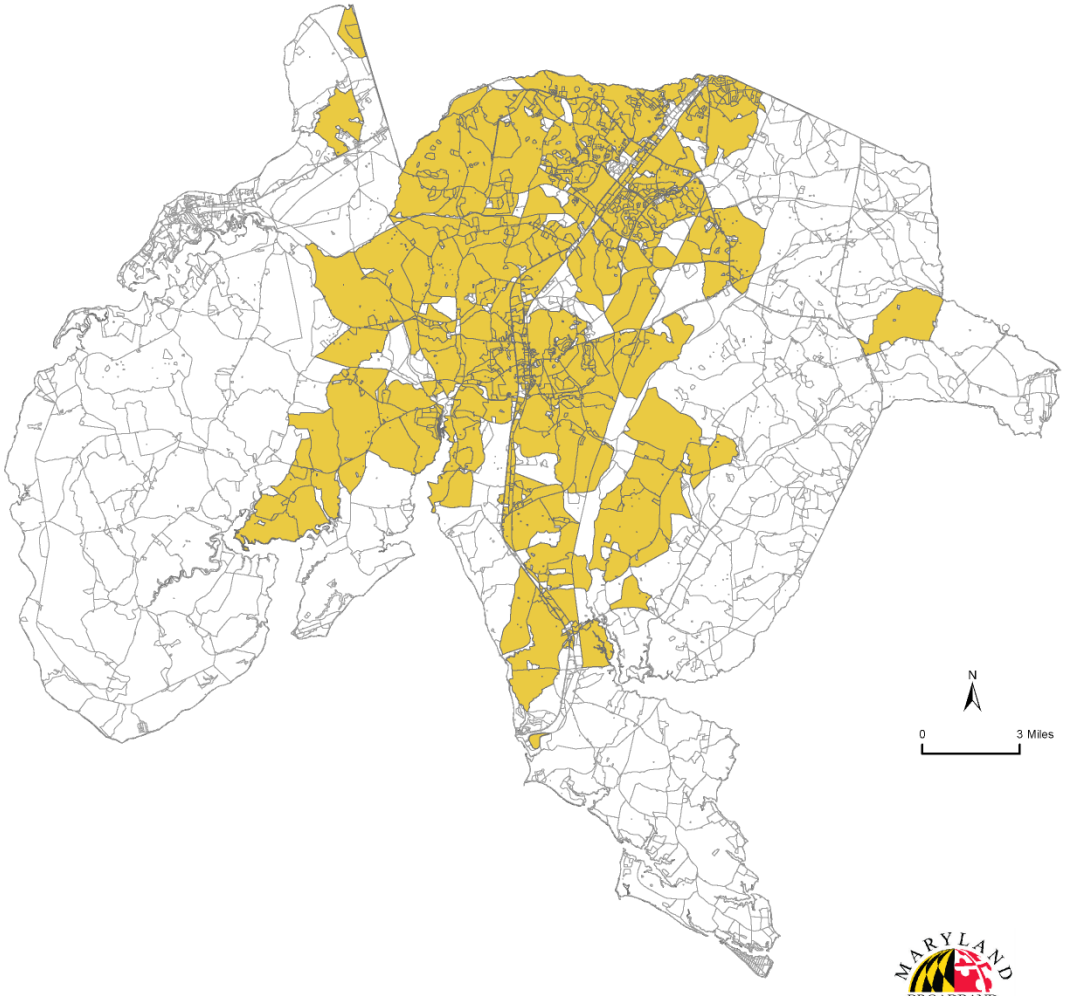
Cable Broadband Services
Queen Anne's County, MD

December 2013



Fiber to the End User Broadband Services
Charles County, MD

December 2013



Census Block 2010

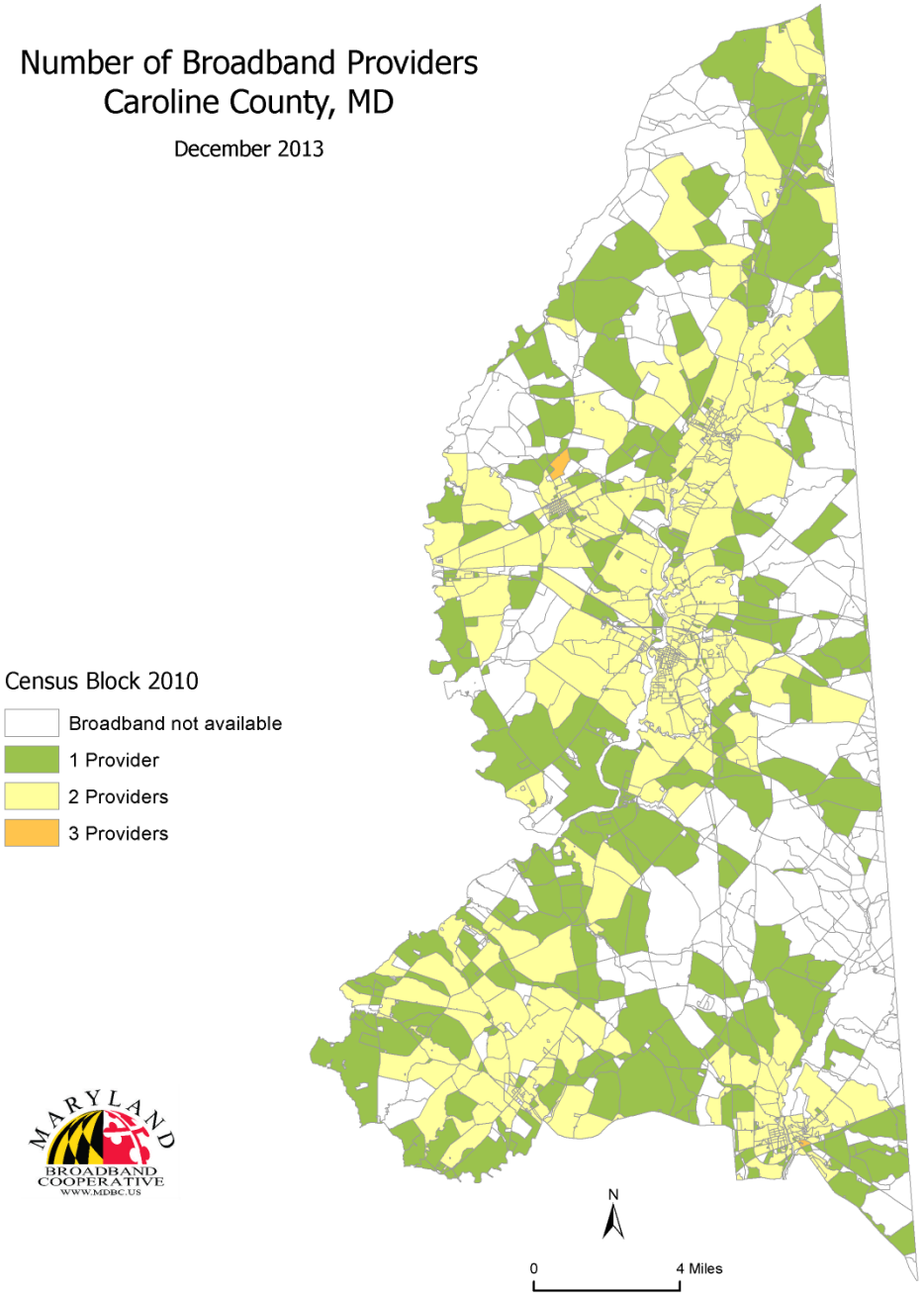
Fiber Broadband available (21.1%)

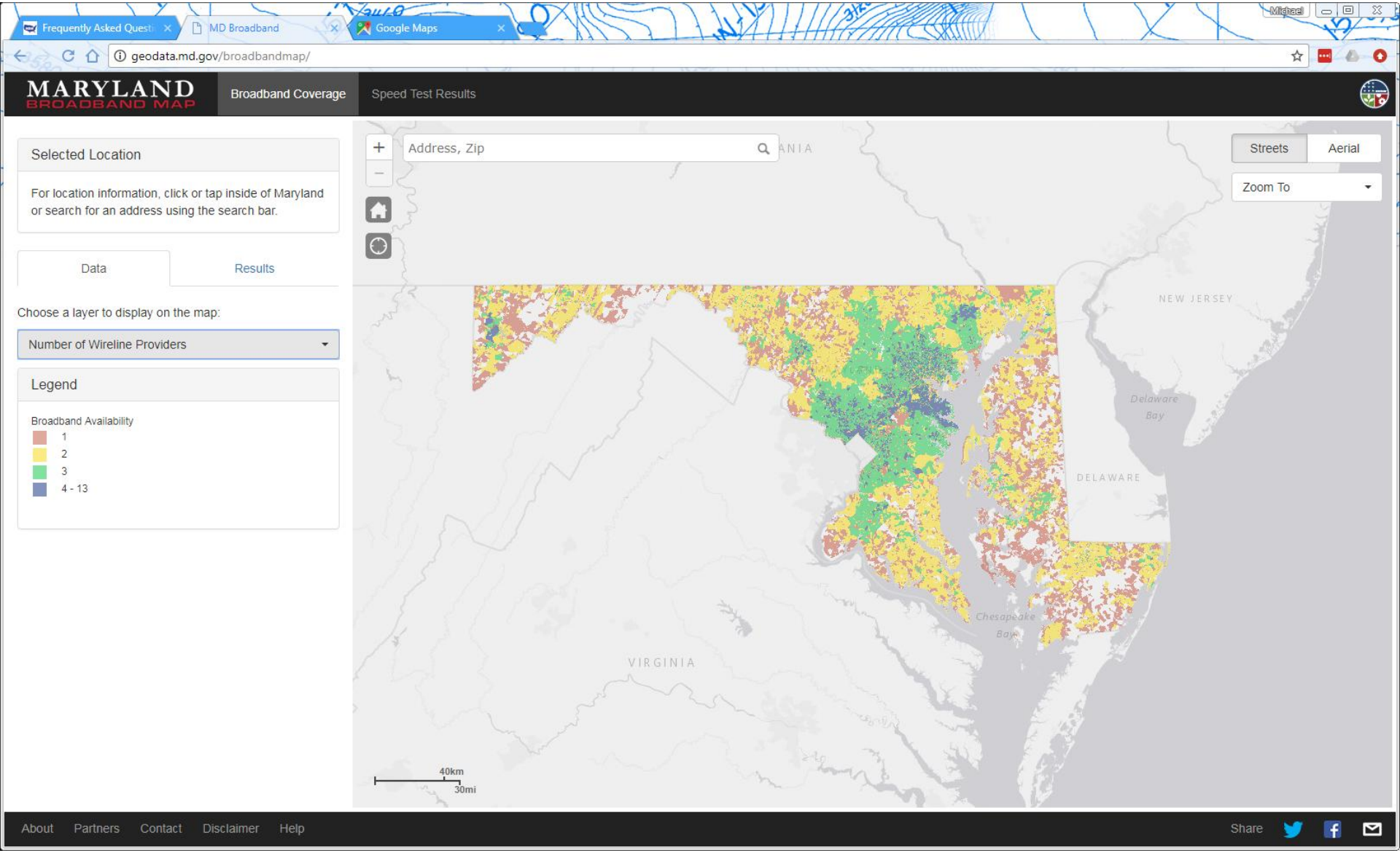
Optical Carrier/Fiber Broadband service unavailable (78.9%)

* 1153 out of 5455 census blocks (water removed) are served by Fiber

Number of Broadband Providers
Caroline County, MD

December 2013




Frequently Asked Quest
MD Broadband
Google Maps
geodata.md.gov/broadbandmap/
MARYLAND
BROADBAND MAP
Broadband Coverage
Speed Test Results
Selected Location
For location information, click or tap inside of Maryland or search for an address using the search bar.
Data
Results
Choose a layer to display on the map:
Number of Wireline Providers
Legend
Broadband Availability
1
2
3
4 - 13
Address, Zip
Streets
Aerial
Zoom To
NEW JERSEY
Delaware Bay
DELAWARE
Chesapeake Bay
VIRGINIA
40km
30mi
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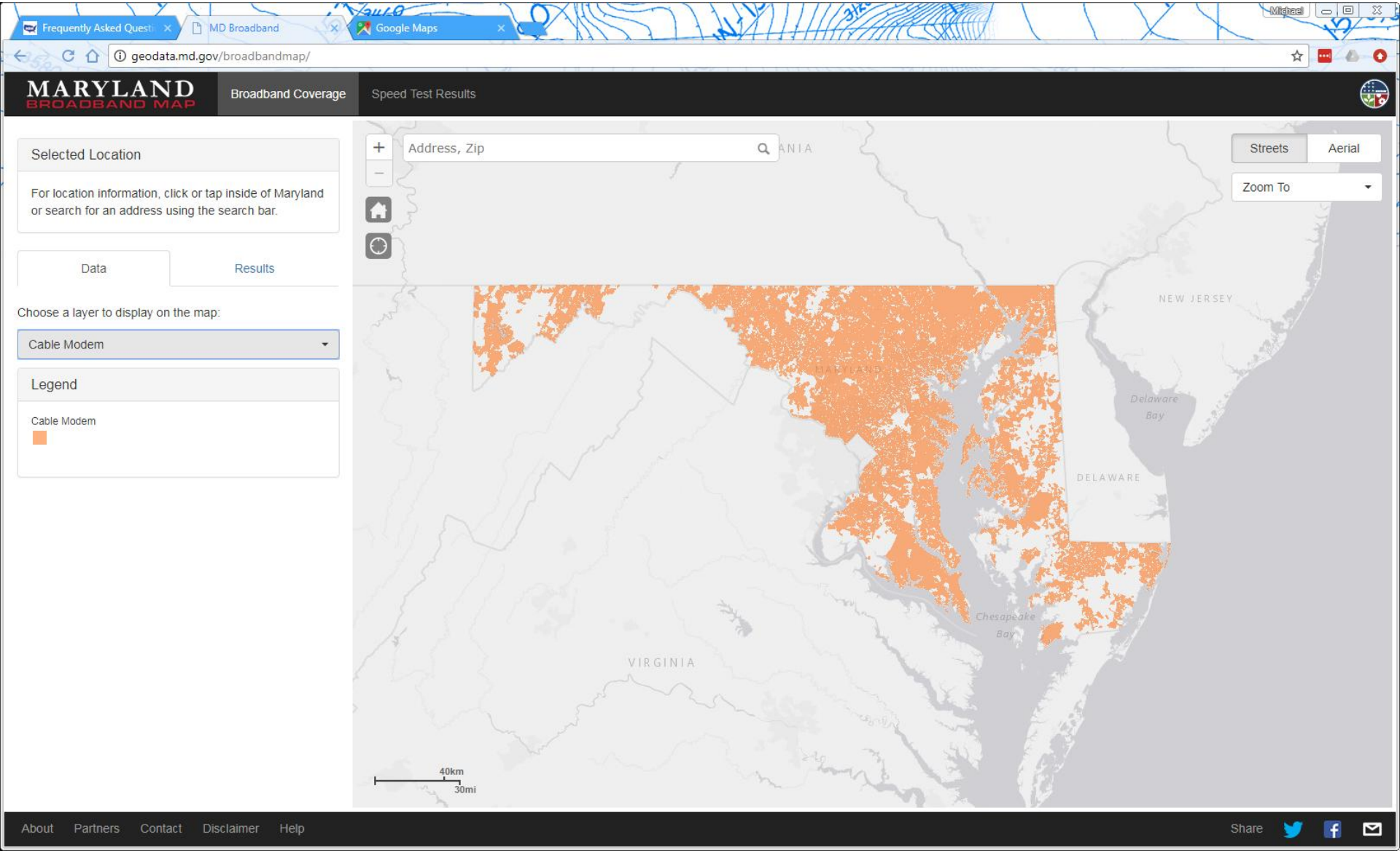
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BROADBAND MAP
Broadband Coverage
Speed Test Results
Selected Location
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Data
Results
Choose a layer to display on the map:
Cable Modem
Legend
Cable Modem
Address, Zip
Streets
Aerial
Zoom To
NEW JERSEY
MARYLAND
Delaware Bay
DELAWARE
Chesapeake Bay
VIRGINIA
40km
30mi
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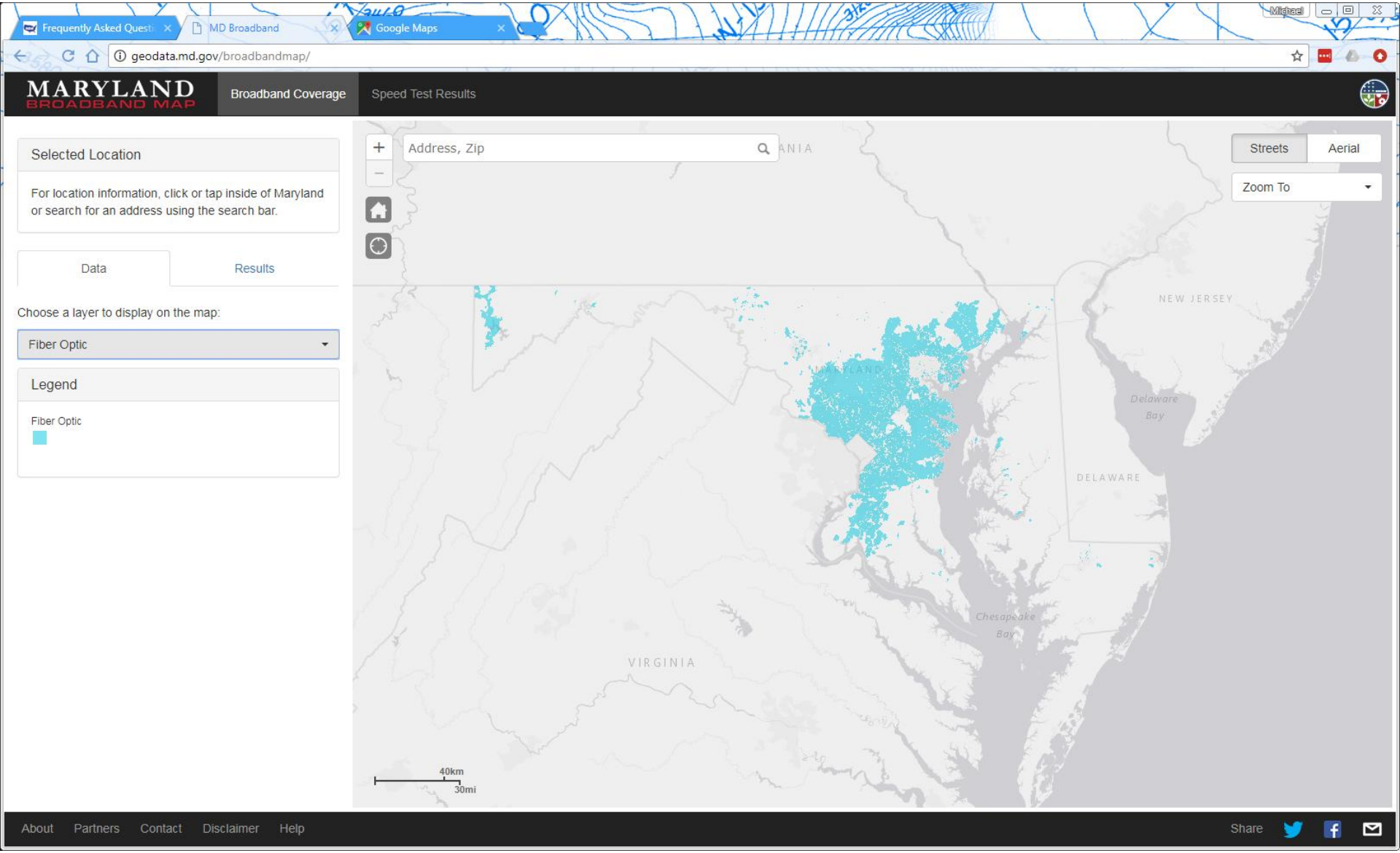
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MARYLAND
BROADBAND MAP
Broadband Coverage
Speed Test Results
Selected Location
For location information, click or tap inside of Maryland or search for an address using the search bar.
Data
Results
Choose a layer to display on the map:
Fiber Optic
Legend
Fiber Optic
Address, Zip
Streets
Aerial
Zoom To
NEW JERSEY
Delaware Bay
DELAWARE
Chesapeake Bay
VIRGINIA
40km
30mi
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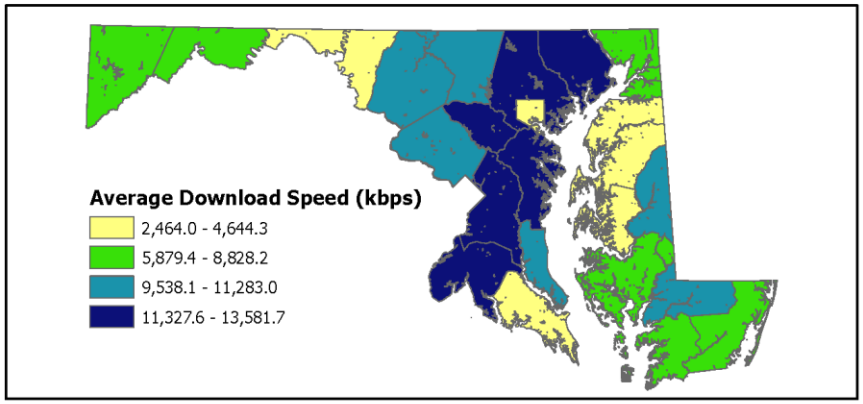
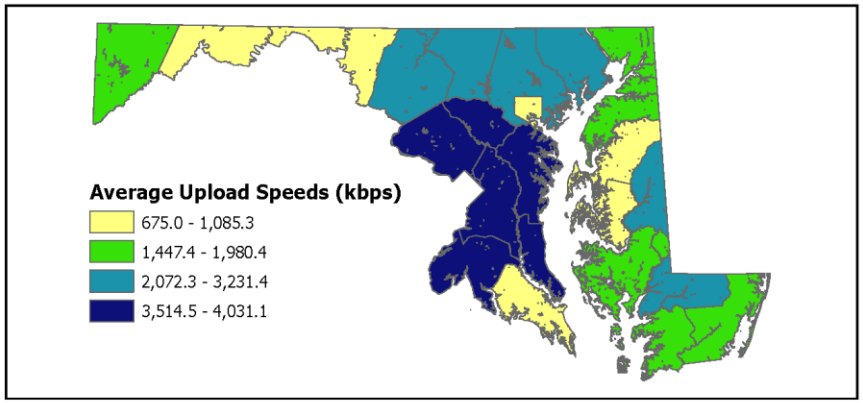
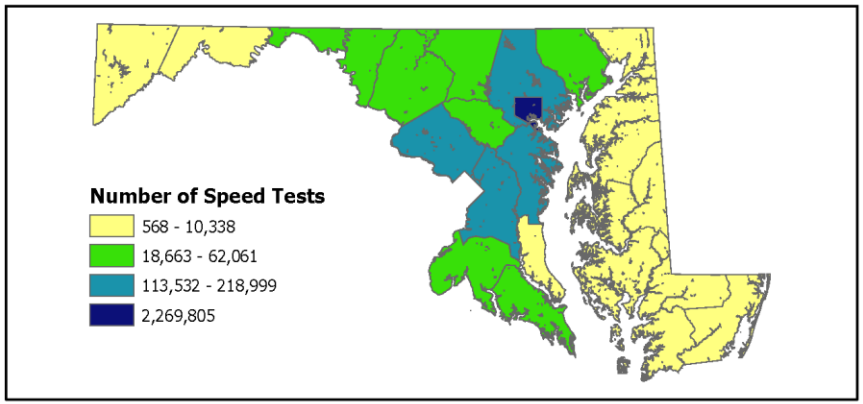
Many other data collected as well

- Wireline speed tests
- Mobile wireless testing
- Comprehensive address point locations
  - 2.24 Million points
  - Forms basis for statewide geocoding engine
- Community Anchor Institutions
- Public Fiber Optic Assets

Speed Test Statistics in Maryland, 2009

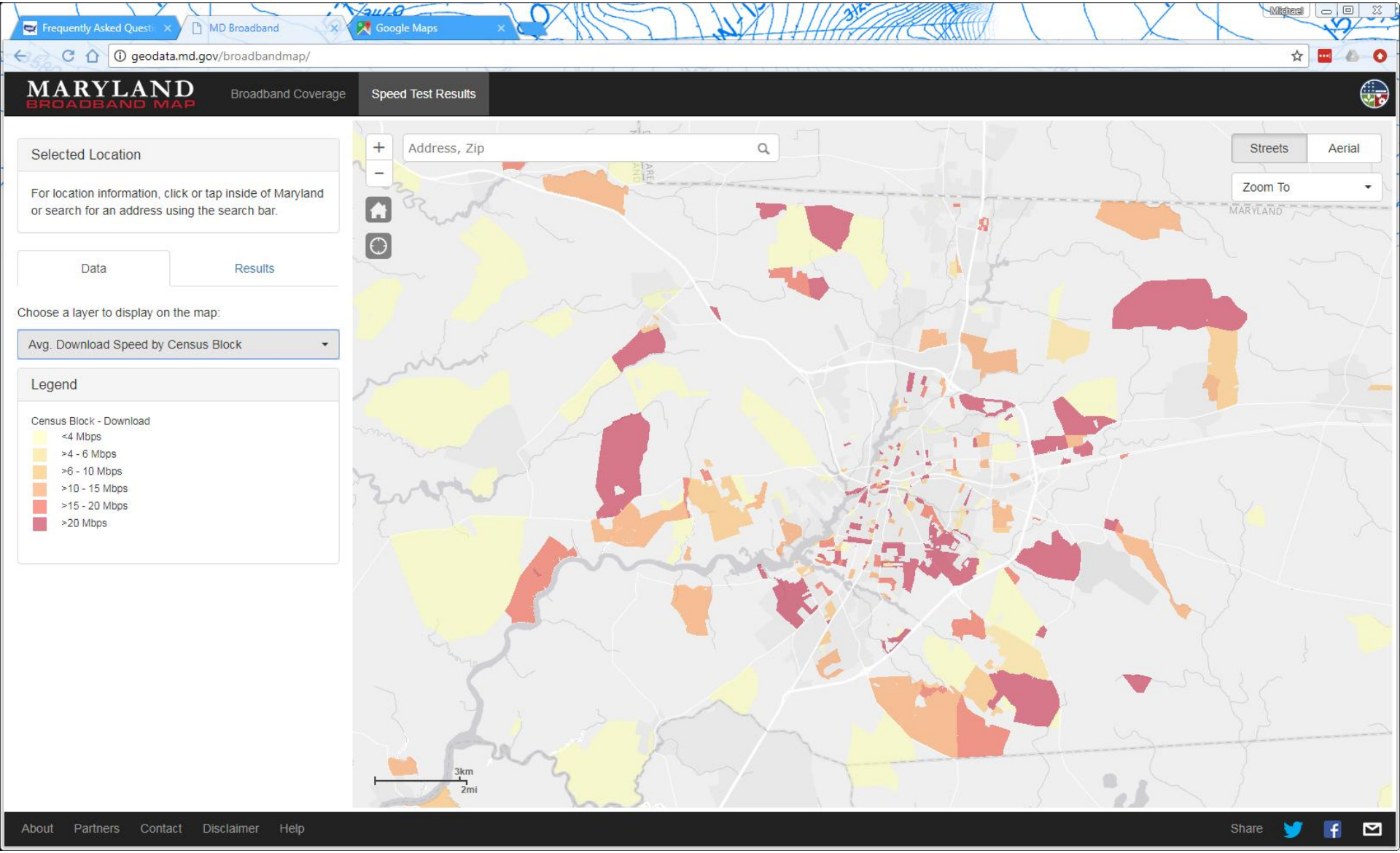






ESRGC

Source: Ookla.com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MARYLAND
BROADBAND MAP
Broadband Coverage
Speed Test Results
Selected Location
For location information, click or tap inside of Maryland or search for an address using the search bar.
Data
Results
Choose a layer to display on the map:
Avg. Download Speed by Census Block
Legend
Census Block - Download
<4 Mbps
>4 - 6 Mbps
>6 - 10 Mbps
>10 - 15 Mbps
>15 - 20 Mbps
>20 Mbps
Address, Zip
Streets
Aerial
Zoom To
MARYLAND
3km
2mi
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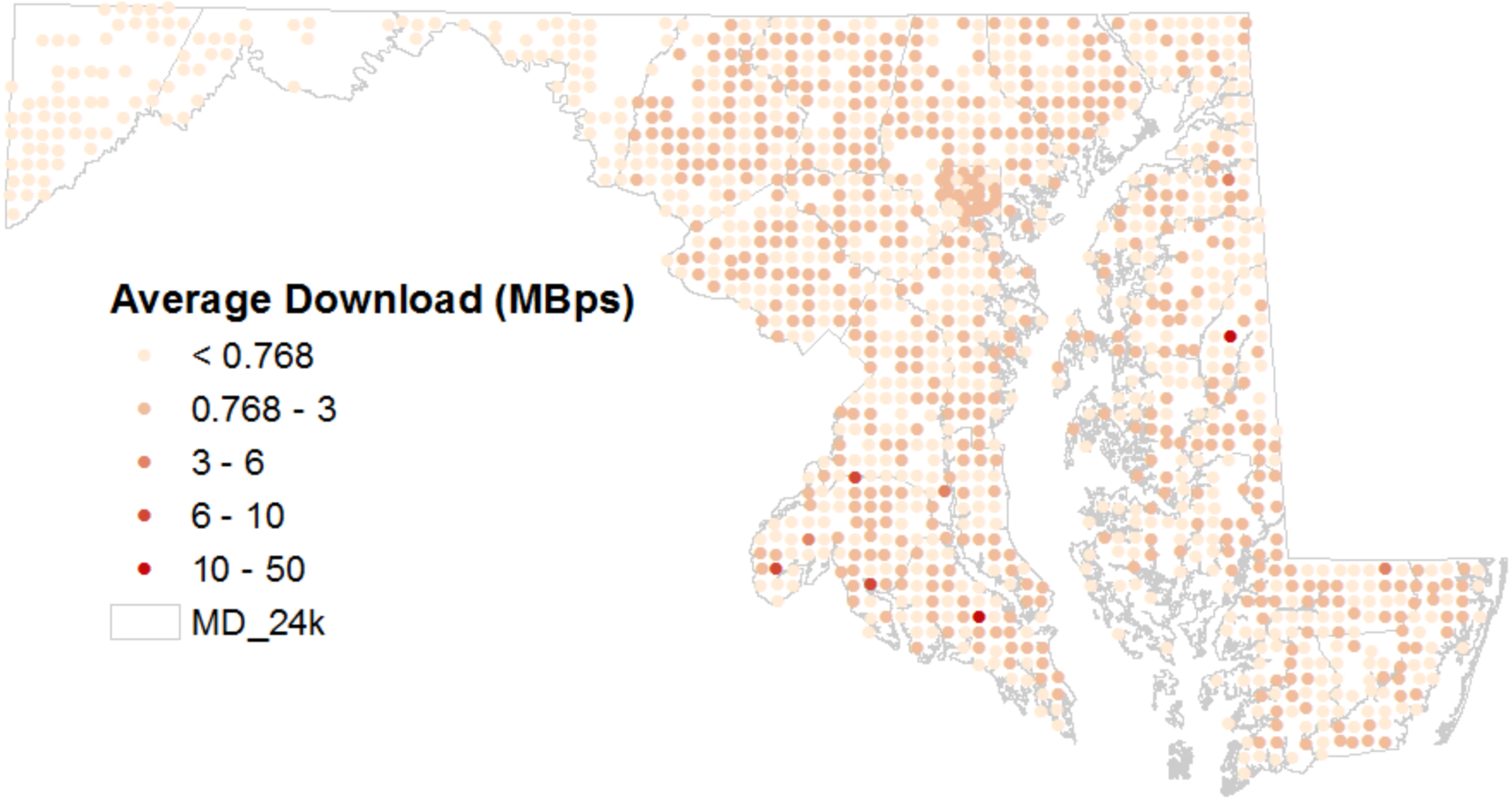
Wireless Testing - 2013

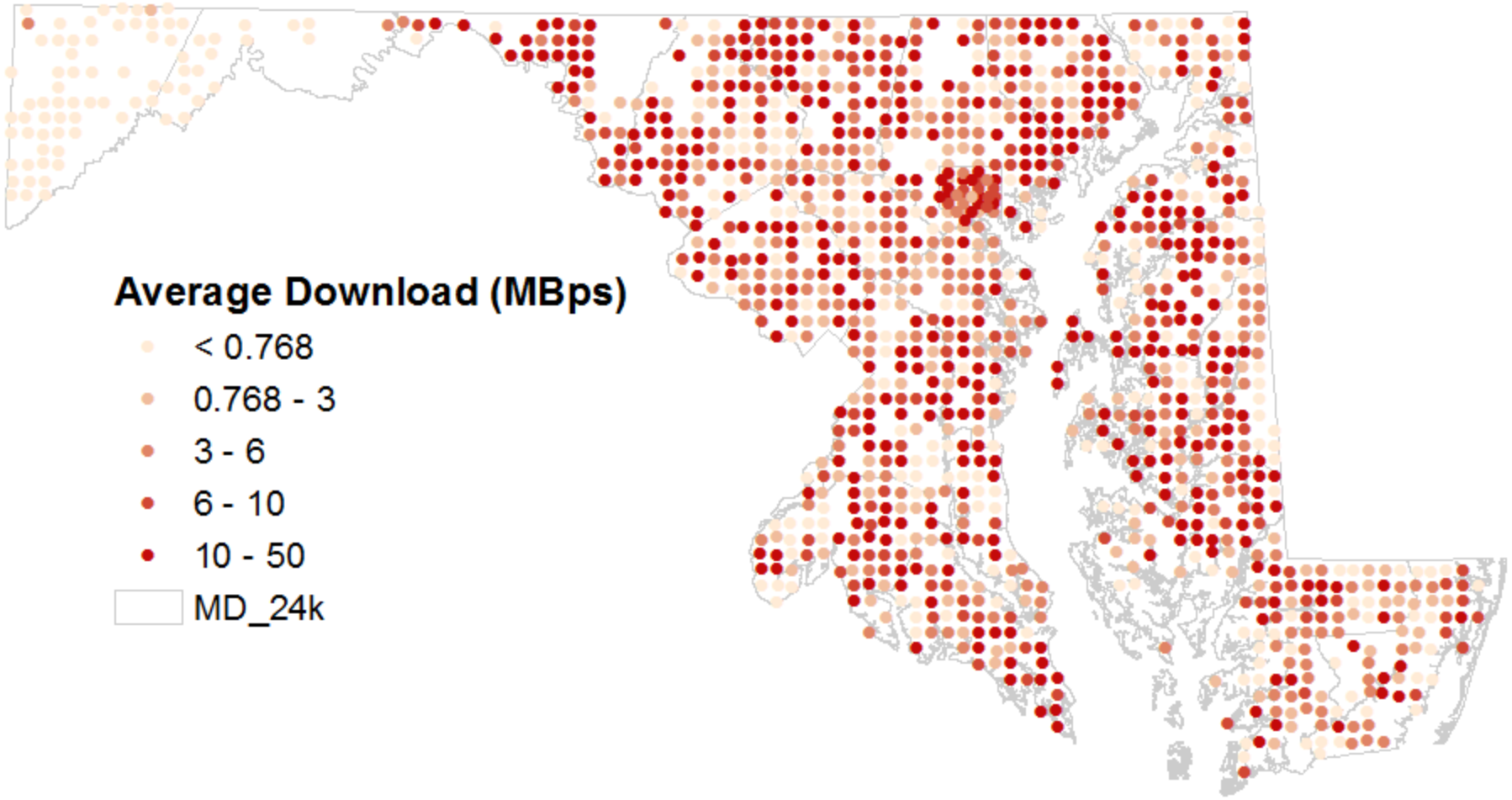
- Unfortunately, as everyone who uses a cell phone knows, provider maps of coverage areas are, at best, aspirational

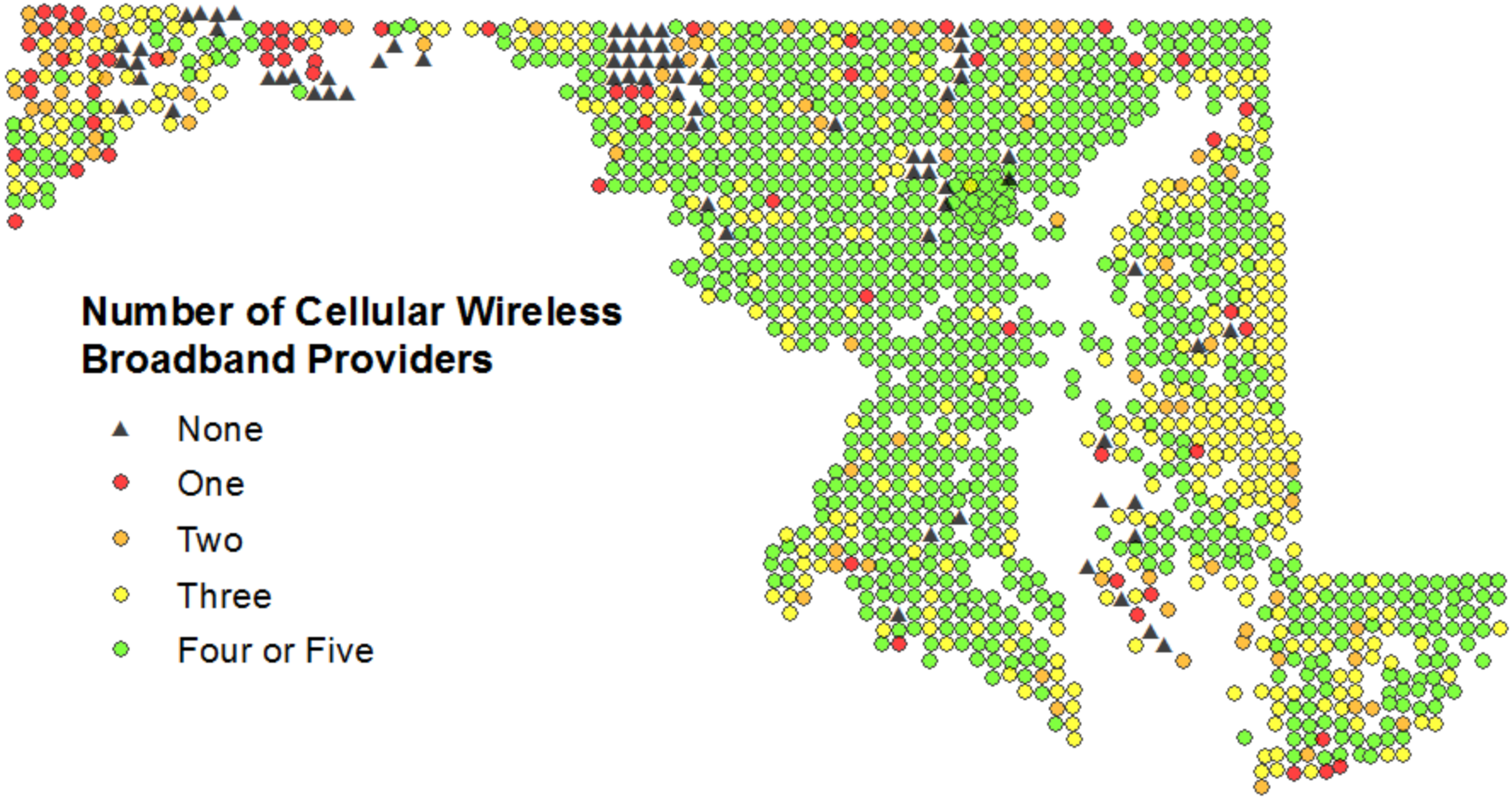
- To determine the validity of the coverage areas, we conducted field checks via a systematic sample
  - Both presence of signal and speed was recorded
  - Some important key biases
    - Only visited once
    - 3 samples in a row
    - Average the values
    - Retail phones/data plans
    - Consumer-grade testing app
    - Had to be able to drive there

Wireless Testing Results: Verizon Wireless - 3G



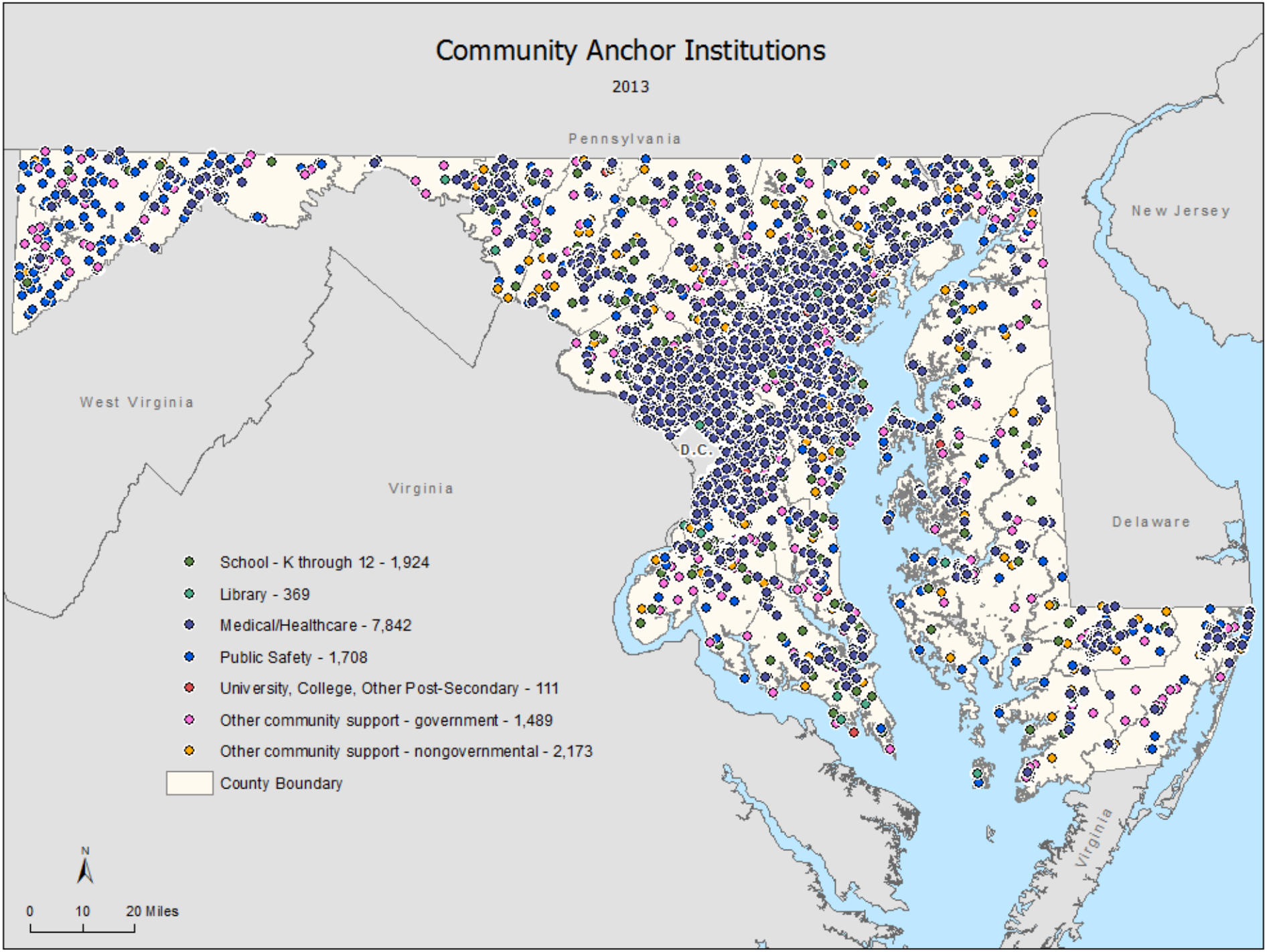
Wireless Testing Results: Verizon Wireless - 4G LTE

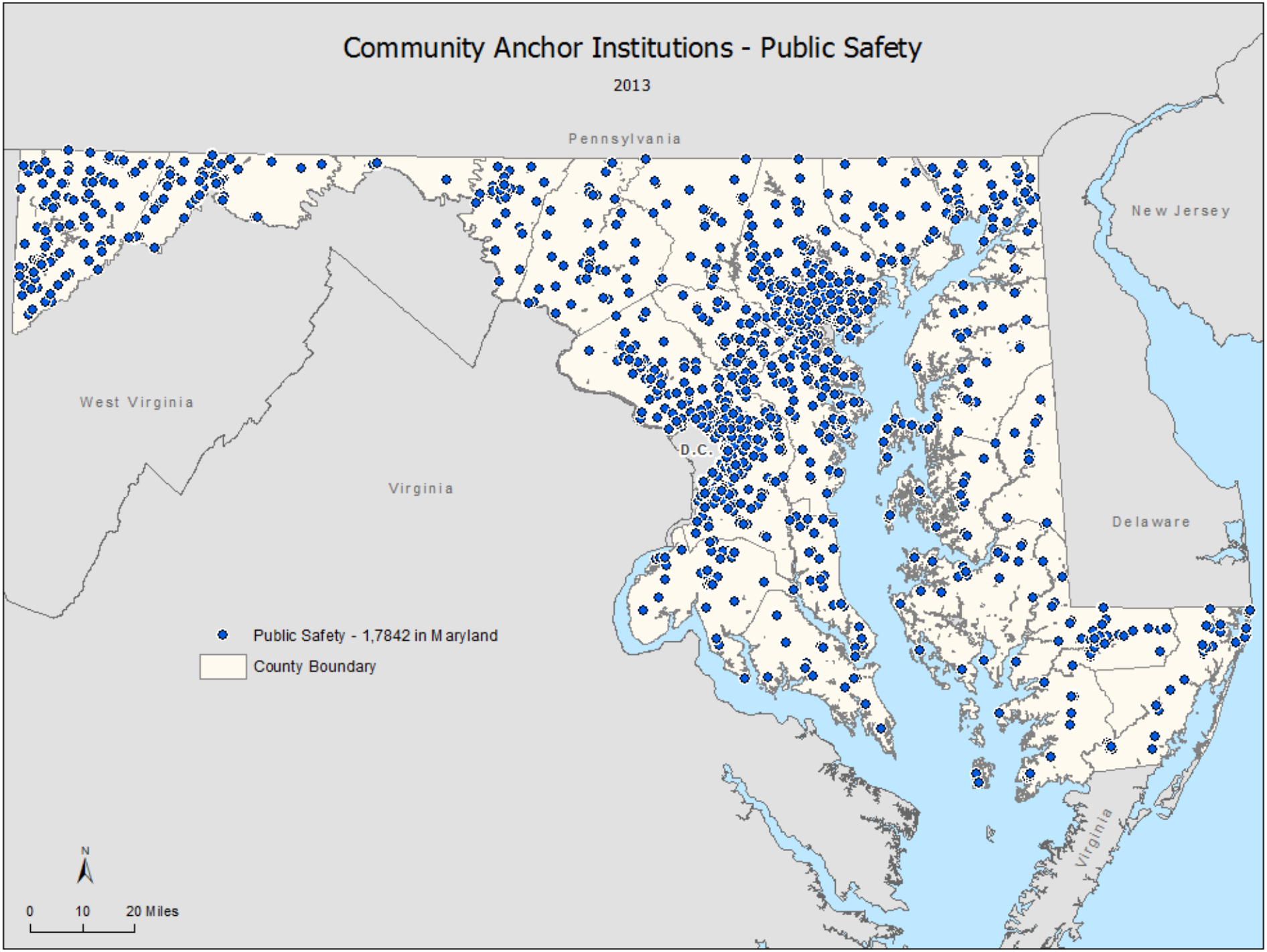



Number of Cellular Wireless Broadband Providers
None
One
Two
Three
Four or Five

Community Anchor Institutions

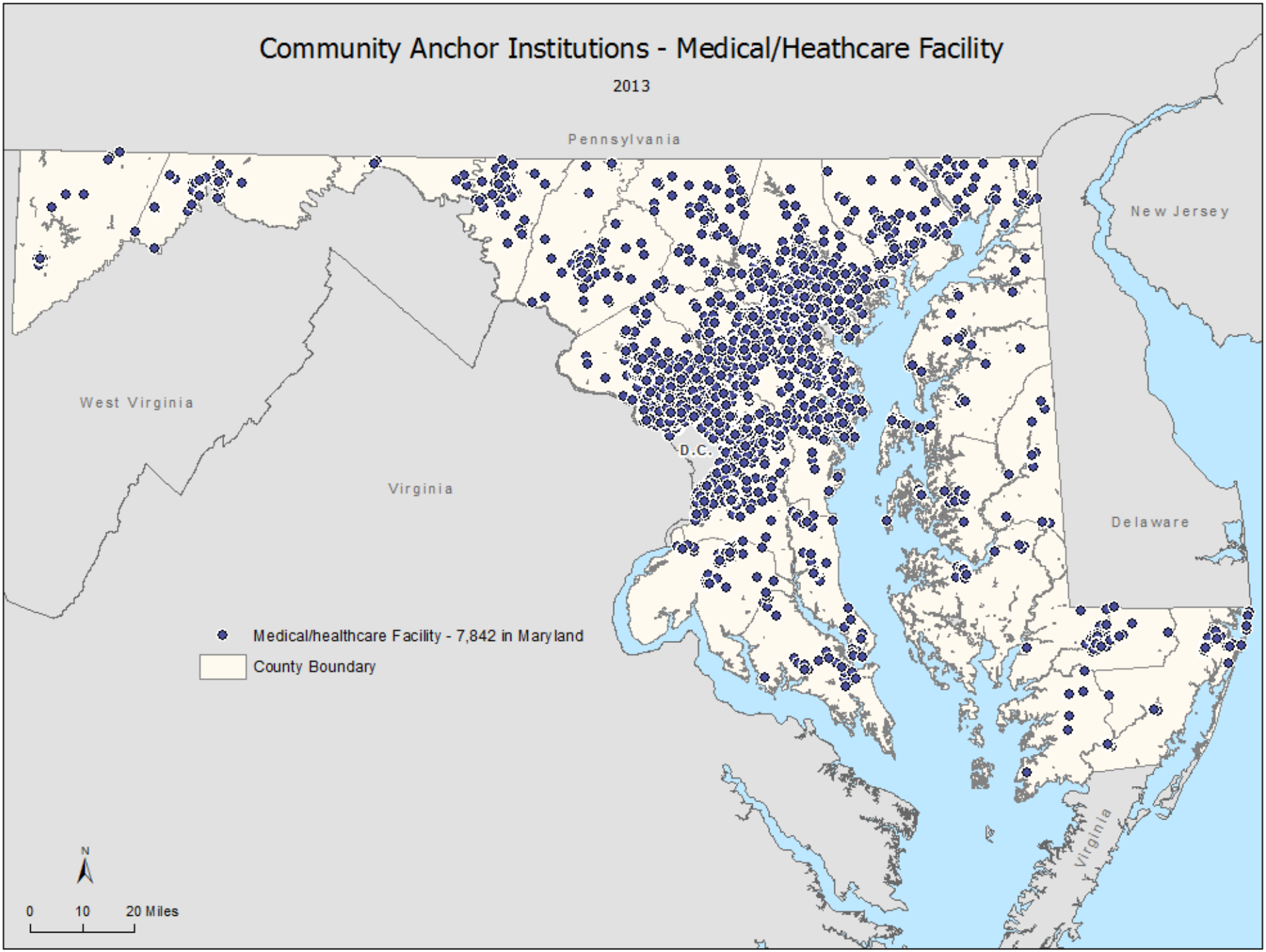
- As part of the NTIA's strategic broadband initiative
- Grantees collected connectivity information for seven categories of "community anchor institutions"
  - Schools (K-12), Colleges/Universities, Libraries, Public Safety, Medical/Healthcare, Govt and Non-Govt Community Support
- In MD, that yielded 15,638 CAI's
  - Broadband connectivity info for 23.8%


Community Anchor Institutions
2013
Pennsylvania
New Jersey
West Virginia
D.C.
Virginia
Delaware
Virginia
School - K through 12 - 1,924
Library - 369
Medical/Healthcare - 7,842
Public Safety - 1,708
University, College, Other Post-Secondary - 111
Other community support - government - 1,489
Other community support - nongovernmental - 2,173
County Boundary
N
0
10
20 Miles


Community Anchor Institutions - Public Safety
2013
Pennsylvania
New Jersey
West Virginia
D.C.
Virginia
Delaware
Public Safety - 1,7842 in Maryland
County Boundary
N
0
10
20 Miles
Virginia

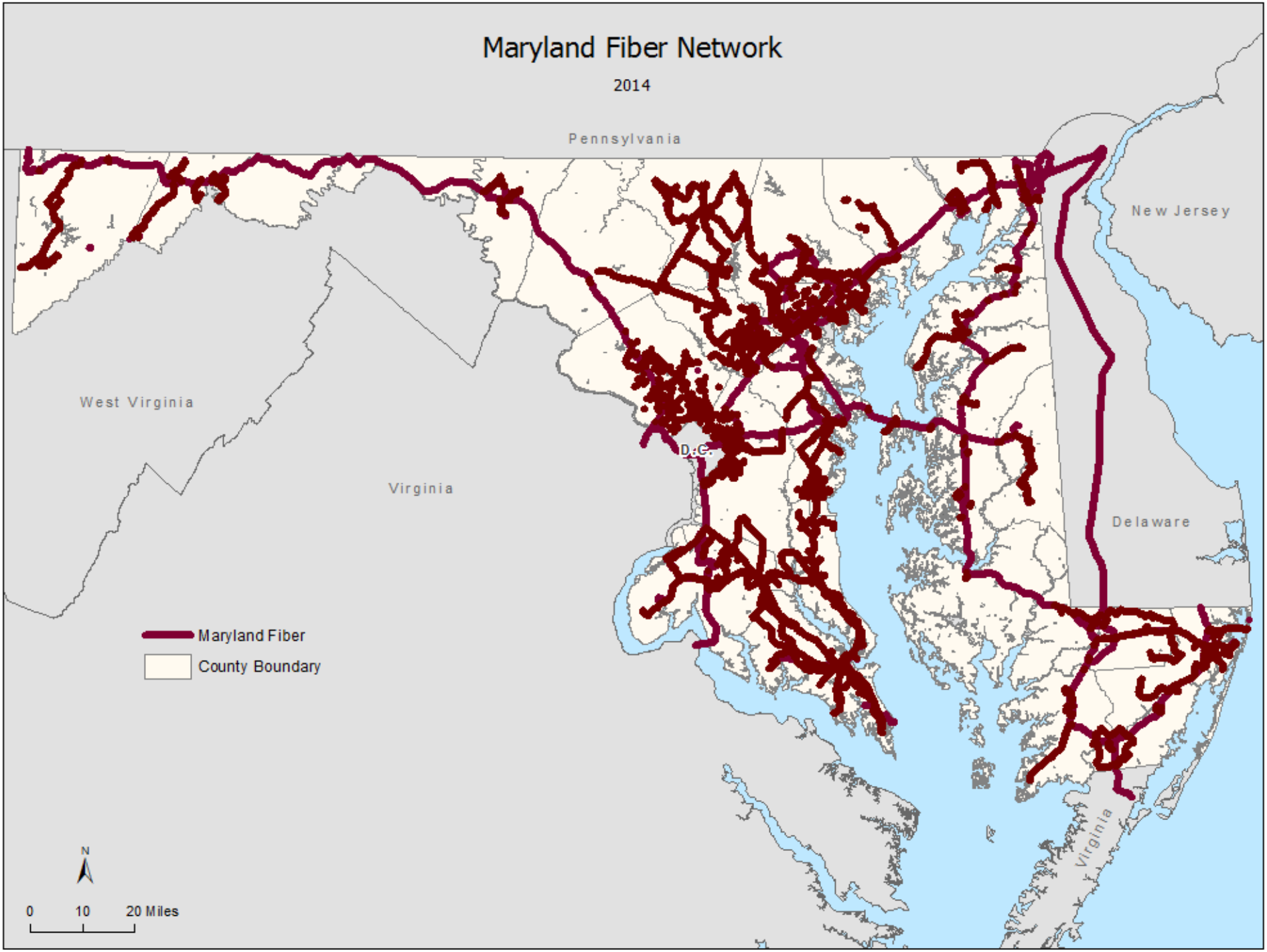
Community Anchor Institutions - Medical/Heathcare Facility

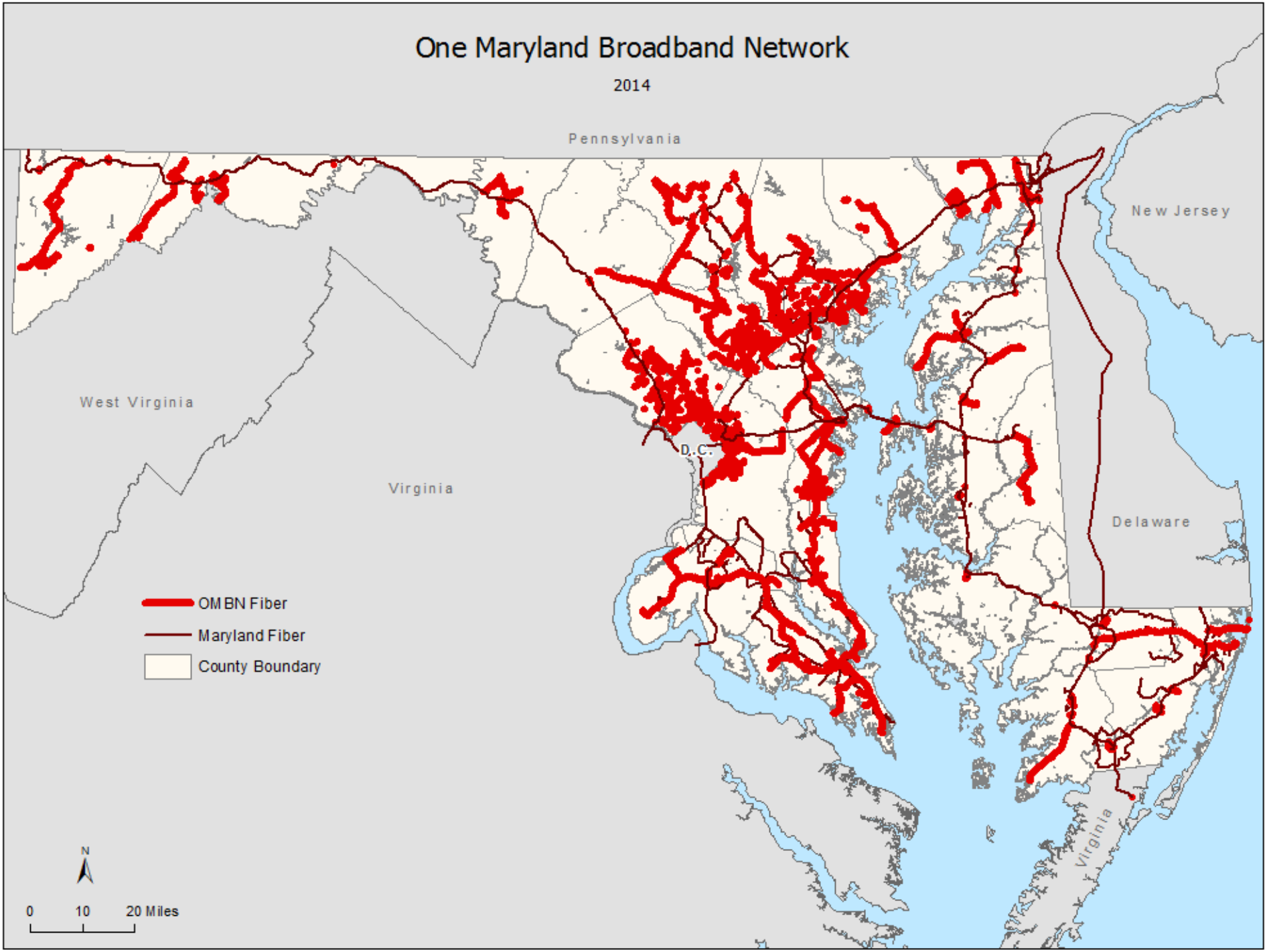
2013

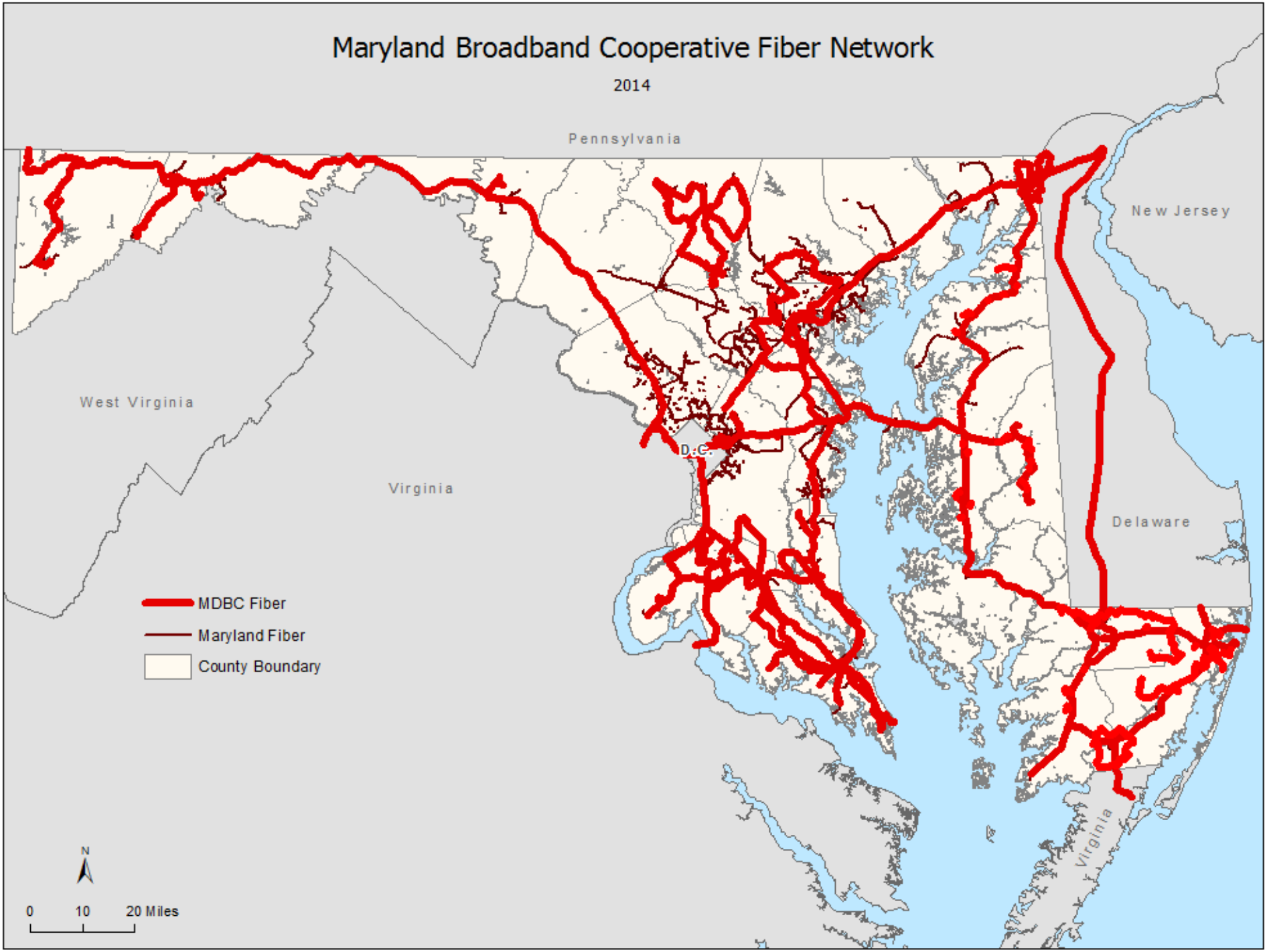


Public Fiber Optic Assets

- While not a formal part of the Maryland Broadband Mapping Initiative, we were asked to help map current public fiber optic assets
- Since then, the State of Maryland has completed an expansive fiber optic build-out program, as a result of their BTOP award
- While much has been done, much remains to do.

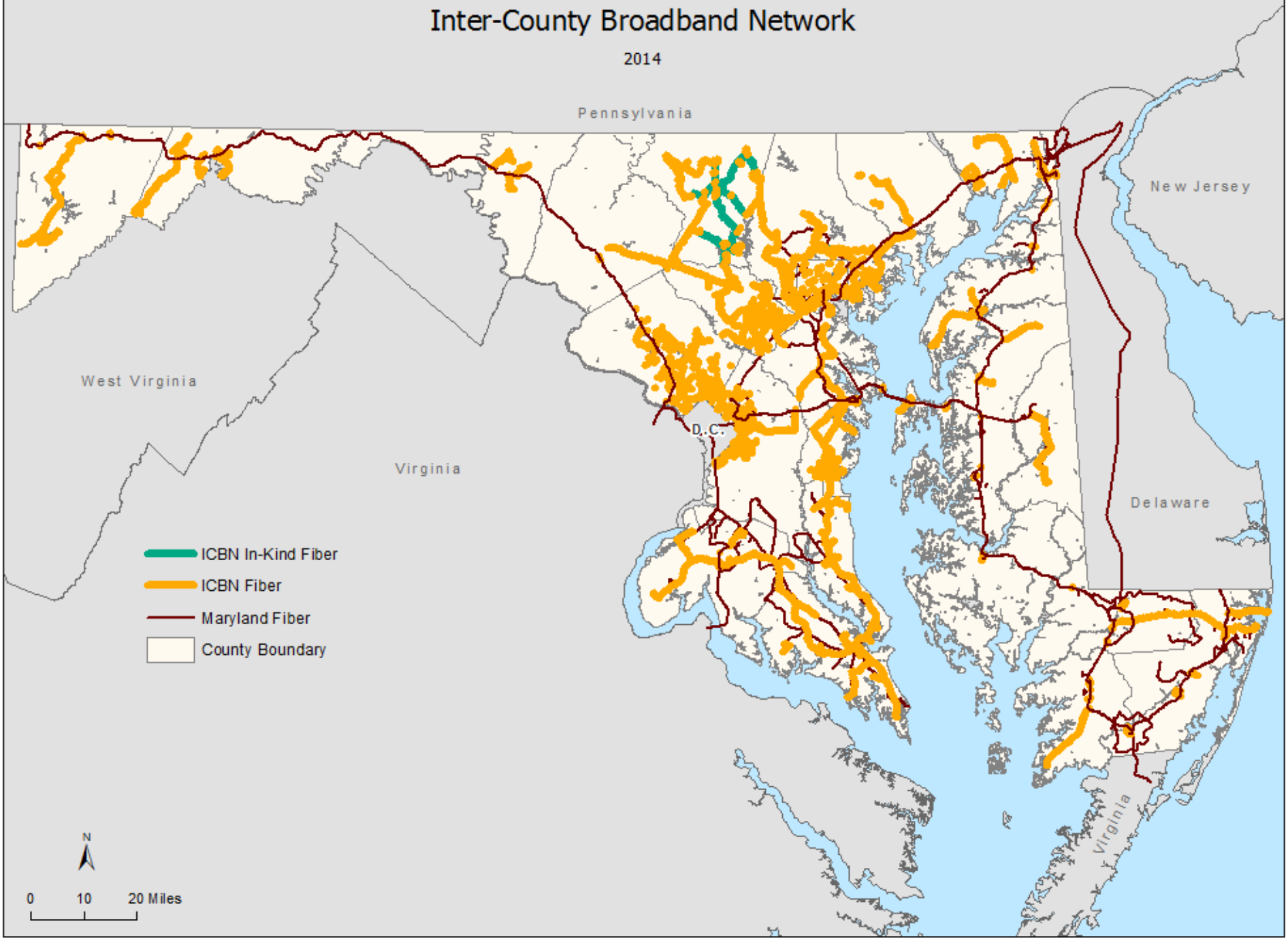

Maryland Fiber Network
2014
Pennsylvania
New Jersey
West Virginia
D.C.
Virginia
Delaware
Virginia
Maryland Fiber
County Boundary
N
0
10
20 Miles


One Maryland Broadband Network
2014
Pennsylvania
New Jersey
West Virginia
D.C.
Virginia
Delaware
OMBN Fiber
Maryland Fiber
County Boundary
N
0
10
20 Miles
Virginia


Maryland Broadband Cooperative Fiber Network
2014
Pennsylvania
New Jersey
West Virginia
Virginia
D.C.
Delaware
Virginia
MDBC Fiber
Maryland Fiber
County Boundary
N
0
10
20 Miles

Inter-County Broadband Network

2014



Conclusion

- Broadband mapping is a critical component for both working to reach underserved areas but also preventing unnecessary duplication/competition
- Several states have continued the broadband mapping effort begun by the NTIA. Nearly all of them (who have been successful) have compelled BSPs to participate
  - Passing legislation requiring participation (many forms)
  - Threatening to withhold access to state-owned assets such as rights-of-way
  - Incentive to access state-owned assets such as backbone
- BB mapping in the rural areas generates very little of a competition concern, but will enable the identification of marginally-viable areas that could be served with the right incentives.